CLAIMS

What is claimed is:

1. A method of forming a fluid bearing, comprising:
forming a plate having a face surface and a bonding surface opposing the face surface, said plate forming a surface of said fluid bearing;
coupling a first side of a body to the bonding surface of the plate;
placing the face surface of the plate against a predetermined surface; and
generating a pressure difference to conform the face surface to the predetermined surface.

2. The method of claim 1, wherein during said generating step a pressure at the bonding surface is greater than a pressure at the face surface.

3. The method of claim 1, wherein the predetermined surface is a guideway and said plate has a pattern formed on said face surface.

4. A method of forming a fluid bearing as in claim 1 wherein said coupling step uses an adhesive which is flexible before hardening and wherein said generating step is performed during at least a portion of a time that said adhesive hardens such that said face surface replicates a shape of said predetermined surface, and wherein said plate is compliant.

5. The method of claim 3, wherein the pattern provides channels for distribution of fluid flow on the face surface.

6. The method of claim 4, wherein the plate comprises a material that can be etched and wherein a pattern is formed on said face surface by etching said face surface.

7. The method of claim 4, wherein the generating step comprises injecting the adhesive under pressure and creating a vacuum between the face surface and the predetermined surface.

8. The method of claim 4, wherein a pattern is formed on said face surface and the pattern includes a plurality of grooves coupled to an orifice.

9. The method of claim 4, wherein a pattern is formed on said face surface and the pattern includes a plurality of grooves coupled to an orifice and a fluid flow restrictor on said face surface.

10. The method of claim 4, wherein the pattern is formed by eroding said face surface.

11. The method of claim 4, wherein said generating step comprises generating a vacuum which is applied through an opening in either the predetermined surface or said plate.

12. A fluid bearing produced according to the process of claim 4.

13. A fluid bearing comprising:

a plate support;

a flexible bearing plate having a bonding surface attached to said plate support with an adhesive which is flexible before hardening, and wherein said flexible bearing plate conforms to a predetermined shape.

14. The fluid bearing of claim 13, wherein a face surface of said flexible bearing plate has a plurality of grooves for distributing fluid pressure during use of said fluid bearing.

15. The fluid bearing of claim 13, wherein said flexible bearing plate is made to conform to said predetermined shape during at least a portion of a time that said adhesive hardens.

16. The fluid bearing of claim 15, wherein said flexible bearing plate is made to conform to said predetermined shape by pressing said flexible bearing plate against the predetermined shape.

17. The fluid bearing of claim 16, wherein the flexible bearing plate is made to conform by injecting the adhesive under pressure between the plate support and the bonding surface of said flexible bearing plate.

18. The fluid bearing of claim 17, wherein the flexible bearing plate is made to conform by applying a vacuum between a face surface which faces said predetermined surface and said predetermined surface.

19. A method of forming a vacuum chuck, comprising:

bonding a back surface of the chuck plate to a bonding surface of a chuck body;

placing a top surface of the chuck plate against a predetermined surface; and

generating a pressure difference between the back surface of the chuck plate and the top surface of the chuck plate to conform the top surface to the predetermined surface.

20. The method of claim 19, further comprising forming at least one opening on a top surface of said chuck plate, wherein at least one opening on the top surface of the chuck plate is for generating a vacuum and wherein the chuck plate is flexible.

21. A method as in claim 20 wherein said vacuum is generated on said top surface during a use of said vacuum chuck.

22. A method as in claim 21 wherein said top surface comprises a pattern of grooves on said top surface for distributing said vacuum, said pattern of grooves being coupled to said at least one opening.

23. A vacuum chuck produced according to the process of claim 21.

24. A method as in claim 22 wherein said pattern of grooves is etched on said top surface.

25. A method as in claim 20 wherein said opening comprises a fluid flow restrictor.

26. A method as in claim 21 wherein said bonding step comprises applying an adhesive which is flexible before hardening and wherein said generating step comprises generating a vacuum between said predetermined surface and said top surface during at least a portion of a time in which said adhesive hardens.

27. A vacuum chuck produced according to the process of claim 26.

28. A vacuum chuck comprising:

a plate support;

a flexible vacuum plate having a top surface for creating a vacuum at said top surface, said flexible vacuum plate having a bonding surface which is attached to said plate support with an adhesive which is flexible before hardening, and wherein the flexible vacuum plate conforms to a predetermined surface.

29. A vacuum chuck as in claim 28 wherein said flexible vacuum plate is made to conform to said predetermined surface during at least a portion of a time that said adhesive hardens.

30. A vacuum chuck as in claim 29 wherein said vacuum chuck is used to secure a wafer during a wafer processing operation.

31. A vacuum chuck as in claim 29 wherein the flexible vacuum plate is made to conform by applying a vacuum between said top surface and said predetermined surface.

32. A vacuum chuck as in claim 31 wherein said top surface comprises a plurality of grooves for distributing a vacuum, and wherein said plurality of grooves is formed by etching said top surface.

33. A method of forming a guideway, comprising the steps of:

providing a face plate having a face surface and a bonding surface opposing the face surface;

bonding the bonding surface of the top plate to a body;

generating a pressure difference to conform the face surface of the face plate to a predetermined surface.

34. The method of claim 33, further including the step of:

heating the predetermined surface.

35. The method of claim 33, wherein the bonding step uses an adhesive which is flexible before hardening and wherein said pressure difference conforms said face surface during at least a portion of time that said adhesive hardens.

36. The method of claim 33, wherein the face plate and the body have a similar coefficient of expansion.

37. The method of claim 33, wherein the face plate is plate glass and the body is a fiberglass pulltrusion.

38. The method of claim 33, wherein the face plate is a metal tape and the body is a metal extrusion.

39. The method of claim 33, wherein the predetermined surface comprises a vacuum generating surface.

40. A method of forming a fluid bearing as in claim 7 wherein said generating step further comprises injecting at a predetermined pressure a fluid between the bonding surface and the first side, and wherein said predetermined pressure preloads said fluid bearing.

41. A fluid bearing comprising:

a bearing plate having a face surface;

a surface restrictor on said face surface, said surface restrictor for restricting flow of fluid in said fluid bearing, said surface restrictor comprising a channel formed on said face surface.

42. A fluid bearing as in claim 41 wherein said surface restrictor is etched on said face surface.

43. A vacuum chuck as in claim 31 wherein said top surface is etched to create a plurality of pins for supporting an object.

44. A vacuum chuck as in claim 43 wherein said object is a semiconductor wafer.

45. A method of forming a bearing member for a fluid interface comprising:

etching a pattern in a bearing plate surface of a bearing plate, said bearing plate surface providing a surface for said fluid interface and said pattern providing for fluid flow in said fluid interface.

46. A method as in claim 45 wherein said fluid interface comprises one of a fluid bearing or a vacuum chuck, and wherein said method further comprises bonding said bearing plate to a bearing member.

47. A method as in claim 46 wherein said bonding step comprises applying an adhesive which is flexible before hardening between a bonding surface of said bearing

plate and said bearing member and pressing said bearing plate surface against a predetermined surface during at least a portion of a time that said adhesive hardens.

48. A method as in claim 45 wherein said pattern comprises a fluid flow restrictor etched into said bearing plate surface.